



[4910-13-P]

## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2009-0607; Directorate Identifier 2009-NM-024-AD; Amendment 39-17142; AD 2012-15-13]**

**RIN 2120-AA64**

**Airworthiness Directives; The Boeing Company Airplanes**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

**SUMMARY:** We are superseding an existing airworthiness directive (AD) for all Model 747-100B SUD, 747-300, 747-400, and 747-400D series airplanes; and Model 747-200B series airplanes having a stretched upper deck. The existing AD currently requires repetitively inspecting for cracking or discrepancies of the fasteners in the tension ties, shear webs, and frames at body stations 1120 through 1220; and related investigative and corrective actions if necessary. That AD requires modifying the frame-to-tension-tie joints at body stations 1120 through 1220 (including related investigative actions and corrective actions if necessary), which provides a terminating action for the repetitive inspections. That AD also requires new repetitive inspections after the modification, corrective actions if necessary, and additional modification requirements at a specified time after the first modification. That AD also removed certain airplanes from the applicability. That AD was prompted by reports of cracked and severed tension ties, broken fasteners, and cracks in the frame, shear web, and shear ties adjacent to tension ties for the upper deck. This AD revises the existing AD by adding repetitive open hole high frequency eddy current (HFEC) inspections for cracking in the forward and aft tension tie channels, and repair if necessary. For certain airplanes, this AD also requires a

one-time angle inspection to determine if the angle is installed correctly, and re-installation if necessary; and a one-time open hole HFEC inspection at the fastener locations where the tension tie previously attached to the frame prior to certain modifications, and repair if necessary. This AD also, for the Stage 2 inspections, reduces the initial compliance times for those inspections. We are issuing this AD to detect and correct cracking of the tension ties, shear webs, and frames of the upper deck, which could result in rapid decompression and reduced structural integrity of the airplane.

**DATES:** This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of certain publications listed in the AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of a certain other publication listed in this AD as of November 28, 2007 (72 FR 65655, November 23, 2007).

**ADDRESSES:** For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P. O. Box 3707, MC 2H-65, Seattle, Washington 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>. You may review copies of the referenced service information at the FAA, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, Washington. For information on the availability of this material at the FAA, call 425-227-1221.

#### **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory

evaluation, any comments received, and other information. The address for the Docket Office (phone: 800-647-5527) is Document Management Facility, U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

**FOR FURTHER INFORMATION CONTACT:** Nathan Weigand, Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue SW., Renton, Washington 98057-3356; telephone (425) 917-6428; fax (425) 917-6590; e-mail: [nathan.p.weigand@faa.gov](mailto:nathan.p.weigand@faa.gov).

**SUPPLEMENTARY INFORMATION:**

**Discussion**

We issued a supplemental notice of proposed rulemaking (SNPRM) to amend 14 CFR part 39 to supersede AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007). The SNPRM published in the Federal Register on February 2, 2012 (77 FR 5195). The SNPRM applied to all Boeing Model 747-100B SUD, 747-300, 747-400, and 747-400D series airplanes; and Model 747-200B series airplanes having a stretched upper deck. The original NPRM (74 FR 33377, July 13, 2009) proposed to supersede an existing AD that currently requires repetitively inspecting for cracking or discrepancies of the fasteners in the tension ties, shear webs, and frames at body stations 1120 through 1220; and related investigative and corrective actions if necessary. The original NPRM proposed to require modifying the frame-to-tension-tie joints at body stations (STA) 1120 through 1220 (including related investigative actions and corrective actions if necessary), which would provide a terminating action for the repetitive inspections. The original NPRM also proposed to require new repetitive inspections after the modification, corrective actions if necessary, and additional modification requirements at a specified time after the first modification. The original NPRM also proposed to remove certain airplanes from the applicability. The SNPRM proposed to

add repetitive open hole high frequency eddy current (HFEC) inspections for cracking in the forward and aft tension tie channels, and repair if necessary. For certain airplanes, the SNPRM also proposed to require a one-time angle inspection to determine if the angle is installed correctly, and re-installation if necessary; and a one-time open-hole HFEC inspection at the fastener locations where the tension tie previously attached to the frame prior to certain modifications, and repair if necessary. The SNPRM also, for the Stage 2 inspections, proposed to reduce the initial compliance times for those inspections.

### **Comments**

We gave the public the opportunity to participate in developing this AD. The following presents the comments received on the SNPRM (77 FR 5195, February 2, 2012) and the FAA's response to each comment.

### **Requests to Include Related Rulemaking**

Boeing asked that we include AD 2007-16-19, Amendment 39-15158 (72 FR 45151, August 13, 2007), in the SNPRM (77 FR 5195, February 2, 2012) as related rulemaking. Boeing stated that AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007), is identified as being superseded by the actions proposed in the SNPRM, as specified in paragraph (b) of the SNPRM (titled "Affected ADs"). Boeing noted that AD 2007-16-19 is also affected by those actions. Boeing added that AD 2007-16-19 has inspection requirements at the affected tension tie locations, and doing the modification in paragraph (m) of the SNPRM also ends the inspections required by AD 2007-16-19 for the modified locations. Boeing asked that we change paragraph (b) of the SNPRM to specify that the AD may modify the compliance requirements in AD 2007-16-19.

Boeing also asked that we change paragraph (m) of the SNPRM (77 FR 5195, February 2, 2012) because the modification identified in Boeing Service Bulletin 747-53A2559, Revision 1, dated August 4, 2011, eliminates the need for the inspection

requirements in paragraphs (g), (j), (p), and (q) of AD 2007-16-19, Amendment 39-15158 (72 FR 45151, August 13, 2007). Boeing stated that the corresponding requirements, for body stations 1120 through 1220 only, terminate the inspections required by AD 2007-16-19, and all requirements for body stations 880 through 1100 still apply.

We acknowledge the commenter's requests and agree that AD 2007-16-19, Amendment 39-15158 (72 FR 45151, August 13, 2007), is affected by certain actions in the SNPRM (77 FR 5195, February 2, 2012). However, when Boeing Service Bulletin 747-53A2559, Revision 1, dated August 4, 2011, was issued it contained an alternative method of compliance (AMOC) approval for certain actions in AD 2007-16-19 for the tension tie locations that were modified using Boeing Service Bulletin 747-53A2559, Revision 1, dated August 4, 2011. AD 2007-16-19 also mandated inspections for tension ties between body stations 880 and 1100, which are not included in Boeing Service Bulletin 747-53A2559, Revision 1, dated August 4, 2011. We do not agree to include AD 2007-16-19 in the affected ADs section identified in paragraph (b) of this AD because paragraph (b) of this AD identifies ADs that are superseded, and we are not superseding that AD. In addition, we have not changed paragraph (m) of the SNPRM-(paragraph (p) of this AD) because the inspections of tension ties between body stations 880 and 1100 required by AD 2007-16-19 are not related to this AD. We have made no change to the AD in this regard.

#### **Requests to Change or Add AMOC Language**

Boeing asked that we change paragraph (n) of the SNPRM (77 FR 5195, February 2, 2012) to add a provision for airplanes that were modified per Boeing Drawing 144U0061, including any deviations during the modification and post-modification inspections that were previously approved as an AMOC to AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007). The

provision should specify that those actions are acceptable for compliance with the corresponding actions in the SNPRM.

We acknowledge and agree with the commenter's request. We have added a new paragraph (r)(5) to this AD to allow AMOCs approved previously in accordance with AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007), as a terminating action, to be approved as AMOCs for the requirements of paragraph (p) of this AD.

Boeing also asked that we change paragraph (s)(3) of the SNPRM (77 FR 5195, February 2, 2012) to provide direction for obtaining an AMOC for any deviations that occur when doing the modification specified in Boeing Service Bulletin 747-53A2559, Revision 1, dated August 4, 2011.

We acknowledge the commenter's request; however, the reference to the Boeing Commercial Airplanes Organization Designation Authorization (ODA) specified in paragraph (s)(3) of this AD is our standard language. After the AD is published, we may empower certain authorized representatives of the Boeing ODA to approve AMOCs to deviations during the modification. We have made no change to the AD in this regard.

Boeing asked that we change paragraph (s)(4) of the SNPRM (77 FR 5195, February 2, 2012) to also refer to paragraph (j) of the AD, in addition to the paragraphs identified as corresponding requirements for AMOCs previously approved in accordance with AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007). Boeing stated that paragraph (j) also contains inspection requirements, and previously accomplished repairs can be considered AMOCs for this paragraph.

We agree with the commenter's request for the reason provided. We have added a reference to paragraph (j) of the AD to the AMOC language specified in paragraph (r)(4) of this AD.

### **Request to Include Credit for Supplemental Structural Inspection Document (SSID) Inspections done per Boeing Alert Service Bulletin 747-53A2507**

Boeing asked that we change paragraph (b) of the SNPRM (77 FR 5195, February 2, 2012) to include credit for related SSID inspections. Boeing stated that AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007), included language specifying that inspections done per Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010, meet the requirements of the SSID inspections in structurally significant item (SSI) F-19A.

We agree that the subject SSID inspections are related to this AD. When Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010; and Boeing Service Bulletin 747-53A2559, Revision 1, dated August 4, 2011; were issued, they contained AMOCs to those SSID inspections. Therefore, those inspections do meet the requirements of the SSID inspections in structurally significant item (SSI) F-19A, except as defined in those AMOCs. However, we do not agree to revise paragraph (b) of this AD as that paragraph only identifies ADs that are superseded. We have made no change to the AD in this regard.

### **Request to Change Reporting Requirement**

Boeing asked that we change the reporting requirement in paragraph (l) of the SNPRM (77 FR 5195, February 2, 2012). Boeing stated that the supplemental structural inspections (SSIs) in the SSID are replaced by Stage 1, Stage 2, and post-modification inspections in the SSID. Boeing added that reporting findings from these three inspections is necessary to maintain the fleet monitoring aspects of the SSI program. Boeing asked that paragraph (l) of the SNPRM be changed to add all three inspections to the reporting requirements in lieu of just the Stage 1 inspection currently identified.

We acknowledge the commenter's request and agree that reporting is necessary for maintaining the fleet monitoring aspect of the SSI program. However, maintaining the fleet monitoring of the SSI program is not what the requirements in this AD were meant

to do. We have evaluated the need for continued reporting, as required by paragraph (l) of this AD, and have determined that it is no longer necessary. Therefore, we have removed paragraph (l) from this AD and reidentified subsequent paragraphs accordingly.

#### **Requests to Change Certain Compliance Times**

British Airways asked that we change the compliance time in paragraphs (p) and (q) of the SNPRM (77 FR 5195, February 2, 2012) to match the compliance time for the Stage 2 inspections. British Airways stated that this would reduce further disruption to the operator's heavy maintenance program.

UPS asked that the compliance time specified in paragraph (m)(1) of the SNPRM (77 FR 5195, February 2, 2012) be changed for the Boeing Special Freighter (BSF) and the Boeing Converted Freighter (BCF). UPS stated that since the modifications to the BSF and BCF configurations were done after original production, the compliance times in that paragraph are not appropriate for the replaced structure. UPS added that the remaining locations (stations 1140, 1180, and 1220) are not adjacent to each other. UPS believes that the risk of widespread fatigue damage has been greatly reduced at those locations. UPS stated that for airplanes that have been modified to the BSF or BCF configuration, the compliance time threshold should take into account the replaced structure.

We do not agree with the commenters' requests. In developing an appropriate compliance time for this action, we considered the urgency associated with the subject unsafe condition and the practical aspect of accomplishing the required actions within a period of time that corresponds to the normal scheduled maintenance for most affected operators. Further, we considered and agree with the compliance time recommended by the manufacturer in Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010. In addition, UPS provided no technical justification for changing the compliance time for the BSF and BCF airplanes. However, under the provisions of



paragraph (r) of this AD, we will consider requests for approval of changing the compliance time if sufficient data are submitted to substantiate that the new compliance time would provide an acceptable level of safety. We have not changed the AD in this regard.

British Airways also asked that the modification threshold be increased from 17,000 total flight cycles to 20,000 total flight cycles. British Airways stated that an increased threshold would align with the Model 747-400 design service goal and the SSID inspection threshold of 20,000 total flight cycles.

We do not agree with the commenter's request. This request was already addressed in the comments section of the SNPRM (77 FR 5195, February 2, 2012) under "Request to Extend the Modification Compliance Time." As stated in the SNPRM:

Since the issuance of Boeing Alert Service Bulletin 747-53A2507, dated April 21, 2005, further cracking in the fleet has occurred resulting in thresholds being further reduced in Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010. The modification threshold and new inspection threshold are appropriate given the quantity and nature of cracks found on Model 747 airplanes, which are based on extensive analysis. Due in part to the reporting requirement of AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007) the manufacturer received a significant number of inspection findings. The findings include numerous cases of single or dual tension tie failure and one airplane with three adjacent severed tension ties. Because the findings constituted multiple site damage, a damage tolerance analysis alone was no longer appropriate. Rather, a widespread fatigue damage analysis had to be employed to properly analyze the risk of cracked and severed tension ties, and to set inspection and modification thresholds appropriately. The manufacturer performed widespread fatigue analysis and the FAA accepted its findings.

The analysis, combined with the empirical data, supported an inspection threshold of 10,000 total flight cycles, as reflected in Revision 1 of the Stage 2 inspection, and a modification threshold of 17,000 total flight cycles.

Therefore, based upon crack reports received, material analysis completed, and widespread fatigue damage analysis performed, the inspection and modification thresholds contained in this AD are appropriate.

We have made no change to the AD in this regard.

#### **Request to Terminate Certain Inspections**

UPS asked that the inspections required by paragraphs (o) and (q) of the SNPRM (77 FR 5195, February 2, 2012) be terminated after the modification required by paragraph (m) of the SNPRM is accomplished. UPS stated that the structure replaced by the modification, which is the structure that would have been inspected, has been removed.

We agree with the commenter's request; if the structure has been removed the inspection is not possible. Therefore, we have changed paragraph (m) of the SNPRM (77 FR 5195, February 2, 2012) (paragraph (p) of this AD) to include a reference to paragraphs (o) and (q) of the SNPRM – (paragraphs (l) and (n) of this AD) in the terminating action language for the inspections. We have also included terminating action language in those paragraphs.

#### **Request for an Optional Modification**

British Airways asked that it be allowed to continue the Stage 1 and Stage 2 inspections with an option of doing the modification as terminating action for the inspections. British Airways added that the Stage 2 inspections provide an adequate level of safety, as the discrepant structure is repaired to a similar compliance standard as the original structure. British Airways noted that the substantial number of work-hours necessary to do the modification would be a significant financial burden.

This request was already addressed in the comments section of the SNPRM (77 FR 5195, February 2, 2012) under "Request for an Optional Modification." As stated in the SNPRM, we do not agree with the request to make the required modification optional.

The crack finding data and analysis performed support the inspection and modification actions in the SNPRM. Therefore, we have not changed the AD in this regard.

#### **Request to Use Substitute Fasteners**

UPS asked that paragraphs (g) and (j) of the SNPRM (77 FR 5195, February 2, 2012) be changed to specify that it is structurally acceptable to use substitute fasteners per Chapter 51, Sections 51-40-03 and 51-40-05, of the Model 747-400SF Structural Repair Manual (SRM). UPS stated that Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010, includes a General Note which specifies that it is acceptable to use the Model 747-400 SRM for repairs on airplanes modified to BCF configuration, until such time as the SRM is updated with tension tie and frame repairs. UPS noted that Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010, does not have any appropriate references for Model 747-400SF airplanes regarding fastener substitution, open-hole sizes, and installation.

We do not agree with the request. Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010, identifies procedures for fastener substitution in paragraph 3.A., Notes 4, 5, and 9 of the Accomplishment Instructions. Therefore, we have made no change to the AD in this regard.

#### **Requests to Clarify/Correct Paragraph Identifiers within Certain Paragraphs in the SNPRM (77 FR 5195, February 2, 2012)**

Boeing asked that we provide clarification in paragraph (g) of the SNPRM (77 FR 5195, February 2, 2012) that the reference to paragraph (l) of this AD as the terminating action paragraph should instead be paragraph (m) of this AD. Boeing added that paragraph (m) mandates the modification in Boeing Service Bulletin 747-53A2559, Revision 1, dated August 4, 2011, which terminates the repetitive inspections required by paragraph (g) of the SNPRM.

We agree with the commenter. Paragraph (g) of the SNPRM (77 FR 5195, February 2, 2012) specifies that doing the modification required by paragraph (l) of the

AD terminates the repetitive inspections; however, that is in error. The modification is specified in paragraph (m) of the SNPRM – (paragraph (p) of this AD). We have changed the paragraph reference in paragraph (g) of this AD accordingly.

Boeing and UPS asked that we correct the error in paragraph (i)(1) of the SNPRM (77 FR 5195, February 2, 2012) which refers to doing the next inspection in accordance with paragraph (j) of this AD, but should instead refer to paragraph (h) of this AD.

We partially agree with the commenters. Paragraph (i)(1) of the SNPRM (77 FR 5195, February 2, 2012) specifies doing the next inspection after the initial Stage 1 inspection done in accordance with paragraph (j) of this AD; however, that is in error because the initial Stage 1 inspection is in paragraph (g) of this AD (paragraph (h) only contains the compliance times for the initial inspection). We have changed the reference in paragraph (i)(1) of this AD accordingly.

Boeing and UPS asked that we correct the error in paragraph (j) of the SNPRM (77 FR 5195, February 2, 2012), which refers to paragraph (j) of this AD as the exception paragraph; however, the correct reference is paragraph (k) of this AD.

We agree with the commenters. Paragraph (k) of this AD contains the exception to corrective action instructions. We have corrected the reference in paragraph (j) of this AD accordingly.

Boeing and UPS asked that we correct the error in paragraph (k) of the SNPRM (77 FR 5195, February 2, 2012), which refers to discrepancies found during any inspection required by paragraph (g), (h), or (i) of the AD. Boeing asked that the reference to paragraph (j) of this AD be added to paragraph (k) of this AD. UPS asked that the reference to paragraphs (j), (o), (p), and (q) of this AD be added to the paragraphs referenced in paragraph (k) of this AD.

We partially agree with the commenters. We agree that paragraph (j) of this AD should be included in the corrective action paragraphs referred to in paragraph (k) of this

AD because it is included in the existing requirements. We have changed paragraph (k) of this AD accordingly. However, paragraphs (o), (p), and (q) of the SNPRM (77 FR 5195, February 2, 2012) – (paragraphs (l), (m), and (n) of this AD) are part of the new requirements, and the corrective actions are contained within those paragraphs.

#### **Request to Clarify Undefined Requirement**

UPS stated that the actions specified in paragraph (m) of the SNPRM (77 FR 5195, February 2, 2012) also require an additional modification, which is currently undefined in Boeing Service Bulletin 747 53A2559, Revision 1, dated August 4, 2011. UPS understands that, at this time, Boeing does not believe this additional modification will cause an undue burden. UPS noted that Boeing should include such a requirement in that service information, given the age of the affected fleet and available resources, as opposed to adjusting the limit of validity of the 747 fleet. UPS added that based on its fleet age and current utilization, it does not believe it will be affected; however, UPS is concerned with the precedent of mandating undefined requirements.

We infer that UPS wants clarification of the subject undefined requirement. Boeing has elected not to design the additional modification since Boeing foresees few, if any, operators that would require this modification. For this reason, Boeing Service Bulletin 747 53A2559, Revision 1, dated August 4, 2011, specifies that operators contact Boeing for instructions. We have addressed this issue by requiring AMOC approval when operators are instructed to contact Boeing for instructions. We have made no change to the AD in this regard.

#### **Request to Change Cost Information**

UPS asked that the Costs of Compliance section in the SNPRM (77 FR 5195, February 2, 2012) be changed. UPS stated that the costs specified do not accurately reflect the actual costs. UPS added that, based on its review of the modification instructions and the experiences of other operators that have performed similar

modifications, the actual modification work, not including incidental costs, may take at least 1,000 work-hours to accomplish. UPS stated that this is a substantial increase, and the cost section should be updated in the analysis of this rulemaking.

We do not agree with the commenter's request. This request was already addressed in the comments section of the SNPRM (77 FR 5195, February 2, 2012) under "Request to Change Cost Information." As stated in the SNPRM:

The cost information in this supplemental NPRM describes only the direct costs of the specific required actions. Based on the best data available, the manufacturer provided the number of work hours necessary to do the required actions. This number represents the time necessary to perform only the actions actually required by this supplemental NPRM. We recognize that, in doing the actions required by an AD, operators might incur incidental costs in addition to the direct costs. But the cost analysis in AD rulemaking actions typically does not include incidental costs such as the time necessary for planning, airplane down time, or time necessitated by other administrative actions. Those incidental costs, which might vary significantly among operators, are almost impossible to calculate.

We have not changed the AD in this regard.

## **Conclusion**

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting the AD with the changes described previously – and minor editorial changes. We have determined that these minor changes:

- Are consistent with the intent that was proposed in the SNPRM (77 FR 5195, February 2, 2012) for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the SNPRM (77 FR 5195, February 2, 2012)

We also determined that these changes will not increase the economic burden on any operator or increase the scope of the AD.

## Costs of Compliance

We estimate that this AD affects 67 airplanes of U.S. registry.

We estimate the following costs to comply with this AD:

Estimated Costs				
Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Stage 1 inspections (required by AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007))	19 work-hours X \$85 per hour = \$1,615	\$0	\$1,615 per inspection cycle	\$108,205 per inspection cycle
Stage 2 inspections (required by AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007))	83 work-hours X \$85 per hour = \$7,055	\$0	\$7,055 per inspection cycle	\$472,685 per inspection cycle
Modification (new action)	Between 257 and 263 work-hours, = between \$21,845 and \$22,355	Between \$341,334 and \$345,490	Between \$363,179 and \$367,845	Between \$24,332,993 and \$24,645,615 <sup>1</sup>
Post-modification inspections (new action)	6 work-hours X \$85 per hour = \$510	\$0	\$510 [per inspection cycle]	\$34,170 [per inspection cycle]

<sup>1</sup>Depending on airplane configuration.

## Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, Section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, "General requirements." Under that section, Congress

charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

### **Regulatory Findings**

We have determined that this AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Is not a “significant rule” under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska, and
- (4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

### **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

### **Adoption of the Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

### **PART 39 - AIRWORTHINESS DIRECTIVES**

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.



### **§ 39.13 [Amended]**

2. The FAA amends § 39.13 by removing airworthiness directive (AD) 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007), and adding the following new AD:

2012-15-13 **The Boeing Company:** Amendment 39-17142 ; Docket No. FAA-2009-0607; Directorate Identifier 2009-NM-024-AD.

#### **(a) Effective Date**

This airworthiness directive (AD) is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

#### **(b) Affected ADs**

This AD supersedes AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007).

#### **(c) Applicability**

This AD applies to all The Boeing Company Model 747-100B SUD, 747-300, 747-400, and 747-400D series airplanes; and Model 747-200B series airplanes having a stretched upper deck; certificated in any category; excluding airplanes that have been converted to a large cargo freighter configuration.

#### **(d) Subject**

Air Transport Association (ATA) of America Code 53: Fuselage.

#### **(e) Unsafe Condition**

This AD results from reports of cracked and severed tension ties, broken fasteners, and cracks in the frame, shear web, and shear ties adjacent to tension ties for the upper deck. We are issuing this AD to detect and correct cracking of the tension ties, shear webs, and frames of the upper deck, which could result in rapid decompression and reduced structural integrity of the airplane.

**(f) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(g) Retained Repetitive Stage 1 Inspections with Reduced Repetitive Interval**

This paragraph restates the requirements of paragraph (f) of AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007). For all airplanes: Do detailed inspections for cracking or discrepancies of the fasteners in the tension ties, shear webs, and frames at body stations 1120 through 1220, and related investigative and corrective actions as applicable, by doing all actions specified in and in accordance with “Stage 1 Inspection” of the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2507, dated April 21, 2005, except as provided by paragraph (k) of this AD; or Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010. As of the effective date of this AD only Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010, may be used. Do the Stage 1 inspections at the applicable times specified in paragraphs (h) and (i) of this AD, except as provided by paragraphs (g)(1) and (g)(2) of this AD. Accomplishment of the initial Stage 2 inspection required by paragraph (j) of this AD terminates the requirements of this paragraph. Any applicable related investigative and corrective actions must be done before further flight. Doing the modification required by paragraph (q) of this AD terminates the repetitive inspection requirements of this paragraph.

(1) Where paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2507, dated April 21, 2005, specifies a compliance time relative to “the original issue date on this service bulletin,” this AD requires compliance before the specified compliance time after April 26, 2006 (the effective date of AD 2006-06-11, Amendment 39-14520 (71 FR 14367, March 22, 2006)).

(2) For any airplane that reaches the applicable compliance time for the initial Stage 2 inspection (as specified in Table 1, Compliance Recommendations, under paragraph 1.E., of Boeing Alert Service Bulletin 747-53A2507, dated April 21, 2005)

before reaching the applicable compliance time for the initial Stage 1 inspection:  
Accomplishment of the initial Stage 2 inspection eliminates the need to do the Stage 1 inspections.

**(h) Retained Compliance Time for Initial Stage 1 Inspection**

This paragraph restates the requirements of paragraph (g) of AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007). Do the initial Stage 1 inspection at the earlier of the times specified in paragraphs (h)(1) and (h)(2) of this AD.

(1) At the earlier of the times specified in paragraphs (h)(1)(i) and (h)(1)(ii) of this AD.

(i) At the applicable time specified in paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2507, dated April 21, 2005.

(ii) Before the accumulation of 10,000 total flight cycles, or within 250 flight cycles after November 28, 2007 (the effective date of AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007), whichever occurs later.

(2) At the later of the times specified in paragraphs (h)(2)(i) and (h)(2)(ii) of this AD.

(i) Before the accumulation of 12,000 total flight cycles.

(ii) Within 50 flight cycles or 20 days, whichever occurs first, after November 28, 2007 (the effective date of AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007).

**(i) Retained Compliance Times for Repetitive Stage 1 Inspections**

This paragraph restates the requirements of paragraph (h) of AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007). Repeat the Stage 1 inspection specified in paragraph (g) of this AD at the time specified in paragraph (i)(1) or (i)(2) of this AD, as applicable. Repeat the inspection thereafter at intervals not to exceed 250

flight cycles, until the initial Stage 2 inspection required by paragraph (j) of this AD has been done.

(1) For airplanes on which the initial Stage 1 inspection has not been accomplished as of November 28, 2007 (the effective date of AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007)): Do the next inspection before the accumulation of 10,000 total flight cycles, or within 250 flight cycles after the initial Stage 1 inspection done in accordance with paragraph (g) of this AD, whichever occurs later.

(2) For airplanes on which the initial Stage 1 inspection has been accomplished as of November 28, 2007 (the effective date of AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007)): Do the next inspection at the applicable time specified in paragraph (i)(2)(i) or (i)(2)(ii) of this AD.

(i) For airplanes that have accumulated fewer than 12,000 total flight cycles as of November 28, 2007 (the effective date of AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007)): Do the next inspection before the accumulation of 10,000 total flight cycles, or within 250 flight cycles after November 28, 2007, whichever occurs later.

(ii) For airplanes that have accumulated 12,000 total flight cycles or more as of November 28, 2007 (the effective date of AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007)): Do the next inspection at the later of the times specified in paragraphs (i)(2)(ii)(A) and (i)(2)(ii)(B) of this AD.

(A) Within 250 flight cycles after accomplishment of the initial Stage 1 inspection.

(B) Within 50 flight cycles or 20 days, whichever occurs first, after November 28, 2007 (the effective date of AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007)).

**(j) Retained Repetitive Stage 2 Inspections with Reduced Initial Compliance Time**

This paragraph restates the requirements of paragraph (i) of AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007). For all airplanes: Do detailed and high frequency eddy current inspections for cracking or discrepancies of the fasteners in the tension ties, shear webs, and frames at body stations 1120 through 1220, and related investigative and corrective actions as applicable, by doing all actions specified in and in accordance with “Stage 2 Inspection” of the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2507, dated April 21, 2005; or Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010; except as provided by paragraph (k) of this AD. Do the initial inspections at the earlier of the times specified in paragraphs (j)(1) and (j)(2) of this AD. Repeat the Stage 2 inspection thereafter at the applicable times specified in paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2507, dated April 21, 2005. As of the effective date of this AD only Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010, may be used. Any applicable related investigative and corrective actions must be done before further flight. Accomplishment of the initial Stage 2 inspection ends the repetitive Stage 1 inspections. Doing the modification required by paragraph (q) of this AD terminates the repetitive inspection requirements of this paragraph.

(1) Before the accumulation of 16,000 total flight cycles, or within 1,000 flight cycles after November 28, 2007 (the effective date of AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007), whichever occurs later.

(2) Before the accumulation of 10,000 total flight cycles, or within 1,000 flight cycles after the effective date of this AD, whichever occurs later.

**(k) Retained Exception to Corrective Action Instructions**

This paragraph restates the requirements of paragraph (j) of AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007). If any discrepancy including but not limited to any crack, broken fastener, loose fastener, or missing fastener is found

during any inspection required by paragraph (g), (h), (i), or (j) of this AD, and Boeing Alert Service Bulletin 747-53A2507, dated April 21, 2005; or Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010; specifies to contact Boeing for appropriate action: Before further flight, repair the discrepancy using a method approved in accordance with the procedures specified in paragraph (r) of this AD.

**(l) New Stage 2 Inspection: Additional Work at STA 1140**

For all airplanes: Except as provided by paragraph (o) of this AD; at the time specified in paragraph 1.E, “Compliance,” of Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010; do an open hole high frequency eddy current (HFEC) inspection for cracking in the forward and aft tension tie channels at 12 fastener locations inboard of the aluminum straps at STA 1140, and before further flight do all applicable repairs. Do all actions in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010. Repeat the inspections thereafter at the time specified in paragraph 1.E., “Compliance” of Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010. Doing the modification required by paragraph (p) of this AD terminates the inspection requirements in this paragraph.

**(m) New One-time Inspection for Mis-located Angles**

For Group 1, Configuration 1, airplanes as identified in Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010: Except as provided by paragraph (o) of this AD, at the time specified in paragraph 1.E, “Compliance,” of Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010, do a detailed inspection to determine if the angle is installed correctly, and before further flight re-install all angles that were installed incorrectly. Do all actions in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010.

**(n) New One-time Inspection for Cracks in Frames at Previous Tension Tie Locations**

For Group 1, Configuration 2, airplanes; and Group 2 and 3 airplanes; as identified in Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010: Except as provided by paragraph (o) of this AD, at the time specified in paragraph 1.E, “Compliance,” of Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010, do an open hole HFEC inspection for cracks at the fastener locations (STA 1120, 1160, 1200, and 1220) where the tension tie previously attached to the frame prior to modification to the Boeing special freighter or Boeing Converted Freighter configuration, and before further flight do all applicable repairs. Do all actions in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010. Doing the modification required by paragraph (p) of this AD terminates the one-time inspection requirements in this paragraph.

**(o) New Exception to Boeing Alert Service Bulletin 747-53A2507, Revision 1, Dated January 14, 2010**

Where paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010, specifies a compliance time relative to “the Revision 1 date of this service bulletin,” this AD requires compliance within the specified compliance time after the effective date of this AD.

**(p) New Modification**

Except as provided by paragraphs (p)(1) and (p)(2) of this AD: At the applicable times specified in paragraph 1.E, “Compliance,” of Boeing Service Bulletin 747-53A2559, Revision 1, dated August 4, 2011, modify the frame-to-tension-tie joints at body stations (STA) 1120 through 1220; do all related investigative and applicable corrective actions; do the repetitive post-modification detailed inspections for cracking of the tension tie and frame structure and all applicable corrective actions; and do the

additional modification. Do all actions in accordance with the Accomplishment Instructions of Boeing Service Bulletin 747-53A2559, Revision 1, dated August 4, 2011. Modifying the frame-to-tension-tie joints at body stations 1120 through 1220 terminates the repetitive inspection requirements of paragraphs (g) and (j) of this AD, the inspection requirements of paragraph (l) of this AD, and the one-time inspection requirements of paragraph (n) of this AD.

(1) Where paragraph 1.E., “Compliance,” of Boeing Service Bulletin 747-53A2559, Revision 1, dated August 4, 2011, specifies a compliance time relative to “the original issue date of this service bulletin,” this AD requires compliance within the specified compliance time after the effective date of this AD.

(2) Where Boeing Service Bulletin 747-53A2559, Revision 1, dated August 4, 2011, specifies to contact Boeing for repair instructions or additional modification requirements: Before further flight, repair the cracking or do the additional actions using a method approved in accordance with the procedures specified in paragraph (r) of this AD.

**(q) New Credit for Previous Actions**

This paragraph provides credit for the corresponding actions required by this AD, if those actions were done before the effective date of this AD using Boeing Alert Service Bulletin 747-53A2559, dated January 8, 2009.

**(r) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, Seattle Aircraft Certification Office (ACO), FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the ACO, send it to the attention of the person identified in the



Related Information section of this AD. Information may be e-mailed to:

[9-ANM-Seattle-ACO-AMOC-Requests@faa.gov](mailto:9-ANM-Seattle-ACO-AMOC-Requests@faa.gov).

(2) To request a different method of compliance or a different compliance time for this AD, follow the procedures in 14 CFR 39.19. Before using any approved AMOC on any airplane to which the AMOC applies, notify your principal maintenance inspector (PMI) or principal avionics inspector (PAI), as appropriate, or lacking a principal inspector, your local Flight Standards District Office. The AMOC approval letter must specifically reference this AD.

(3) An AMOC that provides an acceptable level of safety may be used for any repair required by this AD if it is approved by the Boeing Commercial Airplanes Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO, to make those findings. For a repair method to be approved, the repair must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

(4) AMOCs approved previously in accordance with AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007), are approved as AMOCs for the corresponding requirements of paragraphs (g), (h), (i), and (j) of this AD.

(5) AMOCs approved previously in accordance with AD 2007-23-18, Amendment 39-15266 (72 FR 65655, November 23, 2007), as a terminating action, are approved as AMOCs for the requirements of paragraph (p) of this AD.

**(s) Related Information**

(1) For more information about this AD, contact Nathan Weigand, Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue SW., Renton, Washington 98057-3356; phone: (425) 917-6428; fax: (425) 917-6590; e-mail: [nathan.p.weigand@faa.gov](mailto:nathan.p.weigand@faa.gov).

(2) For service information identified in this AD, contact Boeing Commercial

Airplanes, Attention: Data & Services Management, P. O. Box 3707, MC 2H-65, Seattle, Washington 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>.

(3) You may review copies of the referenced service information at the FAA, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, Washington. For information on the availability of this material at the FAA, call 425-227-1221.

**(t) Material Incorporated by Reference**

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the following service information under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use the following service information to do the actions required by this AD, unless the AD specifies otherwise.

(i) Boeing Alert Service Bulletin 747-53A2507, Revision 1, dated January 14, 2010.

(ii) Boeing Service Bulletin 747-53A2559, Revision 1, dated August 4, 2011.

(3) The following service information was approved for IBR on November 28, 2007 (72 FR 65655, November 23, 2007):

(i) Boeing Alert Service Bulletin 747-53A2507, dated April 21, 2005.

(ii) Reserved.

(2) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P. O. Box 3707, MC 2H-65, Seattle, Washington 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>.

(3) You may review copies of the referenced service information at the FAA, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, Washington. For information on the availability of this material at the FAA, call 425-227-1221.

(4) You may also review copies of the service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to:

[http://www.archives.gov/federal-register/cfr/ibr\\_locations.html](http://www.archives.gov/federal-register/cfr/ibr_locations.html).

Issued in Renton, Washington, on July 23, 2012.

Kalene C. Yanamura,  
Acting Manager,  
Transport Airplane Directorate,  
Aircraft Certification Service.

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